



September 3, 2024

via electronic filing

Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street NE
Washington, DC 20554

RE: *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Petition for Rulemaking, WT Docket No. 24-240, RM-11989*

Dear Ms. Dortch,

On behalf of Silicon Laboratories Inc. ("Silicon Labs"), I am writing to express our strong opposition to the Petition for Rulemaking submitted by NextNav Inc. ("NextNav") seeking to reconfigure the 902-928 MHz band (the "Petition").¹

Silicon Labs is a leader in wireless integrated circuit ("IC") design. As a fabless semiconductor company headquartered in Austin, Texas, and founded in 1996, Silicon Labs has served a pivotal role in the semiconductor industry, underscored by its strong focus on research and development and current leadership in Internet-of-Things ("IoT") wireless connectivity platforms and solutions. With billions of IoT wireless IC components shipped worldwide, Silicon Labs is not merely a recognized leader in the United States but also a globally recognized company dedicated to IoT wireless connectivity. Our integrated hardware and software platforms, intuitive development tools, and unmatched ecosystem support make us an ideal long-term partner in building advanced industrial, commercial, and home and life applications. We lead the industry in high-performance, low-power, and secure IoT connectivity solutions over a wide range of wireless protocols and ecosystems.

Contrary to the assertion made by NextNav in its Petition, the 900-928 MHz ("Lower 900 MHz Band") is heavily utilized by a multitude of products in the hands of end users today, including products using Silicon Labs components. The Lower 900 MHz is essential to smart networks throughout the United States and North America that are used by utilities, smart cities, energy management, smart grid, smart security, and other end-user environments including Advanced Metering Infrastructure (AMI) solutions for electric, water, and gas utilities. These networks provide huge societal and economic benefits to millions of users.

The FCC has historically balanced interests in the Lower 900 MHz Band, which includes ISM, unlicensed part 15 uses, federal radiolocation, and LMS services. The protections written into current rules for the band have fostered extensive and productive unlicensed use of the band over decades.

¹ Petition for Rulemaking of NextNav Inc., WT Docket No. 24-240, RM-11989 (filed Apr. 16, 2024).

Of note, a 2023 IEEE Working Group study of spectrum use in Atlanta showed significant activity by devices operating in the Lower 900 MHz spectrum.² This study concluded, based on real-world measurements, that the Lower 900 MHz Band is “heavily loaded.” In sharp contrast with NextNav’s request to add considerable interference to this band, the study recommends to “ensure precise signal generation with minimized out-of-band emissions” and to “minimize the spectral footprint” for new standards coming up in the band. The study provides real-world data contradicting NextNav’s unsupported claims that the Lower 900 MHz Band is underutilized and that added interference would not cause significant negative impacts on existing devices. While this data is specific to Atlanta, similar data would be expected in other major metropolitan areas.

As described below, if the allocation and rules for the Lower 900 MHz Band were to be changed as requested in the NextNav Petition, an enormous negative impact and disruption would likely occur to hundreds of millions of devices in a wide range of applications and installed systems, including to AMI (electric, water, gas) devices potentially causing significant disruptions and severe consequences for both consumers and utilities. We strongly urge the FCC to reject the Petition and maintain the existing allocations, rules, and protections for the Lower 900 MHz Band, which is the home for so many important devices, networks, and solutions.

Questions in the Public Notice Addressed Herein

The Commission asked the following questions in its Public Notice on the NextNav Petition, each of which are addressed by Silicon Labs herein:

- How would the proposed reconfiguration impact potentially millions of devices operating as unlicensed part 15 devices?
- If the requirement that M-LMS licensees “do not cause unacceptable levels of interference with part 15 devices” were removed, what would be the impact on part 15 devices?
- What services are being provided by part 15 devices in this band?
- Can these uses be accommodated in other spectrum bands?
- What is the status of any outreach by NextNav to part 15 device users?
- Are there alternative ways to reconfigure the band to increase spectrum efficiency and support a terrestrial complement to GPS?

The Lower 900 MHz Band: Current Users, Services Provided, and Potential for Relocation.

The Lower 900 MHz Band is an essential part of the sub-GHz market for IoT connected devices. It has been estimated that over 1.4 billion sub-GHz components have been sold and installed in the United States. This number is projected to grow by over 2 billion components in the next five years.³

² See, *Sub-GHz License-Exempt Frequency Use in Atlanta*, IEEE (Nov. 14, 2023), available at <https://mentor.ieee.org/802.15/dcn/23/15-23-0589-00-wng0-sub-ghz-license-exempt-frequency-use-in-atlanta.pdf>.

³ Source: 2023 Omdia & Silicon Labs estimates.

Silicon Labs is a leading supplier in this sub-GHz component market, providing wireless IC components that use IoT wireless standards, such as Z-Wave⁴ and Wi-SUN⁵, and wireless IC components that use proprietary customer protocols, such as Amazon Sidewalk. Silicon Labs has shipped over 700 million units (“Mu”) of such sub-GHz components to manufacturers that have built products for the North American market for industrial, commercial, and residential end customers. These wireless IC components and end-user products operate as part 15 devices in the Lower 900 MHz Band.

Looking more specifically to products that implement proprietary customer protocols for connectivity solutions operating in the Lower 900 MHz Band, Silicon Labs has shipped over 500Mu of such proprietary sub-GHz components to customers in the United States. These shipments are anticipated to exceed 400Mu over the next four years. Silicon Labs sub-GHz components have been included in hundreds of products by manufacturers, and these products are currently installed in countless end-user homes and businesses. There is obvious and growing demand for sub-GHz wireless IC components in the Lower 900 MHz Band.

Silicon Labs is a major supplier of wireless IC components used in products certified by the Z-Wave Alliance. Z-Wave solutions operate in the Lower 900 MHz Band in North America. Silicon Labs has shipped over 200Mu Z-Wave components worldwide and over 100Mu Z-Wave components to the United States (including shipments by Sigma Designs, which Silicon Labs acquired in 2018). Z-Wave component shipments are anticipated to exceed 60Mu over the next four years. The resulting Z-Wave devices are predominantly deployed in Home Automation and Home Security applications, such as alarm sensors, door locks, switches, sockets, security gateways, and safety critical applications such as smoke detectors.

Silicon Labs is also a major supplier of wireless IC components used in products certified by the Wi-SUN Alliance. Wi-SUN solutions operate in the Lower 900 MHz Band in North America in a wide range of industries. For example, Wi-SUN products are used by many utilities, smart grid and smart city solutions, for example, in electric meters and street lighting. These networks not only provide controls for electric meters and street lighting but provide a communication backbone for many additional smart city applications such as traffic management, smart parking, smart signage, air quality measurement, and structural integrity monitoring. It has been estimated that there are more than 100 million Wi-SUN capable devices already deployed and actively using this frequency band.⁶

Due to the massive existing use of the Lower 900 MHz Band by so many devices, solutions and ecosystems, this band should be seen as a needed, very successful, appropriate, and efficient allocation of frequencies. NextNav assertions to the contrary in its Petition should not be accepted. We are also not aware of alternative ways to reconfigure this Lower 900 MHz Band to accommodate a terrestrial complement to GPS without severe negative impact on these existing uses and devices. Further, the installed base of devices using IoT standards, such as Z-Wave and Wi-SUN, as well as devices using proprietary protocols, such as Amazon Sidewalk, is so large that moving these devices to a different band would cause widespread unreasonable expense, downtime, and operational damage.

⁴ See, <https://z-wavealliance.org>.

⁵ See, <https://wi-sun.org>.

⁶ See, Wi-SUN Alliance, <https://wi-sun.org>.

Degradation To Device Operation in the Lower 900 MHz Band under the Proposed NextNav Framework.

The Lower 900 MHz Band is critical to IoT standards and sub-GHz wireless solutions, and the IoT industry is well-established and rapidly growing in the United States and worldwide. Silicon Labs is deeply concerned by NextNav's proposal to reconfigure the Lower 900 MHz Band as it jeopardizes the operation of the hundreds of millions of installed devices described above.

Reconfiguring the Lower 900 MHz Band as requested by NextNav would drastically degrade currently installed IoT devices operating in this band as well as future installations of such IoT devices. NextNav's requested changes would lead to a significant increase in interference and effectively disable existing deployed devices and stifle continued development. For example, NextNav's request to significantly increase power levels, allow higher OOB, remove restrictions on M-LMS operations, and expand operations to Fixed and Mobile sites would create destructive interference to the communication ability of existing devices.

As an example of this impact on the public, this increased interference and severe degradation to the ability of existing deployed devices to communicate would impact home security systems which predominately use the Z-Wave protocol. This would result in unusable devices, the potential for a large number of false alarms, invalid data, or other failures due to an inability of installed systems to communicate properly. All of this would ultimately pose an unacceptable risk to the safety and security of users of these devices in North America, and could burden our public safety systems and first responders.

Moreover, the changes requested by NextNav would impact mission-critical electrical, water, and natural gas infrastructure which use millions of sub-GHz devices to monitor these networks and bill customers for their usage. Impacting the ability of these devices to communicate would cause billing outages, network reliability issues, and compromise critical infrastructure across North America, potentially causing significant disruptions and severe consequences for both consumers and utilities.

Despite the significant negative impact that would surely follow this increased interference, NextNav provides no information or data to back its assertion that its requested changes would not significantly degrade performance of the hundreds of millions of part 15 devices already operating in the Lower 900 MHz Band. Instead, NextNav unjustifiably seeks the removal of the current requirement that it not cause unacceptable levels of interference to part 15 devices.

Further, to our knowledge, NextNav has not reached out to industry standards development organizations, such as Z-Wave and Wi-SUN, or to other users in the Lower 900 MHz Band to determine the scope of use of the band or impact of the framework proposed in the Petition on that use.

Conclusion.

NextNav's Petition, if accepted, would jeopardize the continued operation of hundreds of millions of unlicensed part 15 devices operating in the Lower 900 MHz Band including Z-Wave based products, Wi-Sun based products, Amazon Sidewalk based products, and other products using proprietary protocols. It would also jeopardize the continued health and growth of the IoT industry in the United States.

We therefore respectfully urge the FCC to reject NextNav's Petition to reconfigure the Lower 900 MHz Band and to maintain the current spectrum allocation as well as related rules and protections. We hope the FCC will act in the public interest and deny NextNav's request.

Thank you for your review and consideration of our comments. If you have any questions, please contact Brian Peterman, Assistant General Counsel at Silicon Labs, at brian.peterman@silabs.com.

Yours truly,

A handwritten signature in blue ink, appearing to read "Jacob Alamat", with a long horizontal line extending to the right.

Jacob Alamat
Senior Vice President & General Manager, Home & Life BU
Silicon Laboratories Inc.
400 W. Cesar Chavez St
Austin, TX 78701